

REMARKS

This Amendment is responsive to the Office Action dated September 22, 2004. Claims 1-30 were pending in the application. In the Office Action, claims 1-9 and 11-17 were withdrawn from consideration, and claims 10, 18, 19 and 22-30 were rejected. In this Amendment, claims 10 and 22 have been amended. Claims 10 and 18-30 thus remain for consideration.

Applicants submit that claims 10 and 18-30 are in condition for allowance and request reconsideration and withdrawal of the rejections in light of the following remarks.

Title

Applicants have provided a new title. The new title is believed to be clearly indicative of the invention to which the claims are directed.

§102 Rejections

Claims 10, 22 and 27-30 were rejected under 35 U.S.C. §102(e) as being anticipated by Tomita (U.S. Patent No. 6,753,608).

Claims 10, 22 and 25-30 were rejected under 35 U.S.C. §102(e) as being anticipated by Kojima et al. (U.S. Patent No. 6,614,096).

Claims 18, 19, 23 and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kojima in view of Cronin et al. (U.S. Patent No. 6,590,290).

Applicants submit that independent claims 10 and 22 are patentable over Tomita and Kojima.

Applicants' invention as recited in claim 10 includes a feature of "the width of the wiring groove in the first insulating film is substantially constant, and the width of the wiring

groove in the second insulating film is substantially constant." Support for this limitation can be found at page 12, lines 20-23, stating "a via hole 17 is formed in the second interlayer insulating film 13, as shown in FIG. 1A, by performing an RIE process, using the resist pattern as an etching mask" and at page 13, lines 20-23, stating "A surface layer of a via hole side surface of the first insulating film 14 and a surface layer of a via hole side surface of the second insulating film 15 are dissolved by wet etching using a chemical solution containing HF, NHF_3 or the like, and removed as shown in FIG. 1B." In this regard it is noted that the RIE process is an etching technique for etching a target layer straightly in the depth direction to form an opening having a straight surface, not a tapered surface or a curved surface, for example. Also, the wet etching technique etches a target layer uniformly. Furthermore, FIG. 1C shows an embodiment in which "the width of the wiring groove ... is substantially constant." Accordingly, claim 1 is clearly supported in the specification and the drawings.

Tomita discloses a semiconductor device. In the semiconductor device Of Tomita, the first and second insulating layers 107 and 108 have a wiring groove in which the second wiring 113, 114 is formed, respectively. However, in Tomita, the width of the wiring groove in the first insulating film 107 is tapered and not constant. Similarly, the width of the wiring groove in the second insulating film 108 is tapered, and not constant.

Hence, claim 10, and claims 27 and 29 depending from claim 10, are not anticipated by Tomita.

Applicants' invention as recited in claim 22 includes a feature of "the width of the second wiring groove in the first insulating film is substantially constant, and the width of the wiring groove in the second insulating film is substantially constant." Since this feature of claim 22 is substantially the same as the claim 10 feature discussed above, Applicants' believe that claim 22, and claims 28 and 30 depending from claim 22, are patentable over Tomita for at least

the same reasons as discussed in connection with claim 10. Support for the feature as recited in claim 22 can be found at page 20, lines 24-25, stating "In the dual damascene (DD) method, a wiring groove 76 and a via hole 77 are formed by using RIE process," and at page 21, lines 3-8, stating "The damaged layer (not shown) formed, due to the RIE process, at the side surface of the first insulating film 74 for defining the wiring groove 76 and via hole 77 is dissolved later in the wet etching process by using chemical solution containing HF, NHF_3 , or the like."

Regarding the rejections based on Kojima, Applicants note that claim 10 of the present application recites a feature of "a width of the wiring groove in the first insulating film is smaller than that in the second insulating film at an interface between the first insulating film and the second insulating film." Kojima discloses a semiconductor device. In the semiconductor device of Kojima, the width of the wiring groove in the first insulating film 34 is equal to, not smaller than, that in the second insulating film 35, 36 at an interface between the first insulating film and the second insulating film. Specifically, the wiring groove in the first insulating film 34 has a lower portion having a small width and an upper portion having a large width. The upper portion having a large width is at an interface between the first insulating film and the second insulating film, and the large width of the upper portion of the wiring groove in the first insulating film is equal to that in the second insulating film. Hence, Kojima does not teach or suggest the claimed feature of "a width of the wiring groove in the first insulating film is smaller than that in the second insulating film at an interface between the first insulating film and the second insulating film," and hence claim 10, and claims 25, 27 and 29 depending from claim 10, are not anticipated by Kojima.

Claim 22 of the present application recites a feature of "a width of the second wiring groove in the first insulating film is smaller than that in the second insulating film at an interface between the first insulating film and the second insulating film." This feature is

substantially the same as the claim 10 feature discussed immediately above. Hence, claim 22, and claims 26, 28 and 30 depending from claim 22, are not anticipated by Kojima for at least the same reasons discussed with respect to claim 10.

Regarding the rejections of claims 18, 19, 23 and 24 under 35 U.S.C. §103(a) as being unpatentable over Kojima in view of Cronin, Applicants note that claims 18, 19, 23 and 24 depend upon claims 10 and 22, respectively. Since claims 10 and 22 have been shown to be patentable over Kojima, Applicants submit that dependent claims 18, 19, 23 and 24 are patentable based at least on their claim dependency.

Applicants respectfully submit that all of the claims now pending in the application are in condition for allowance, which action is earnestly solicited.

It is submitted that these claims, as originally presented, are patentably distinct over the prior art cited by the Examiner, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes to these claims, as presented herein, are not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

Statements appearing above with respect to the disclosures in the cited references represent the present opinions of the Applicants' undersigned attorney and, in the event that the Examiner disagrees with any such opinions, it is respectfully requested that the Examiner specifically indicate those portions of the respective reference providing the basis for a contrary view.

If any issues remain, or if the Examiner has any further suggestions, he/she is invited to call the undersigned at the telephone number provided below.

The Examiner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account No. 50-0320.

The Examiner's consideration of this matter is gratefully acknowledged.

Respectfully submitted,

FROMMER LAWRENCE & HAUG LLP
Attorneys for Applicants

By:



Grace Pan

Reg. No. 39,440

Bruno Polito

Reg. No. 38,580

Tel: (212) 588-0800

Fax: (212) 588-0500